FUTURE FISHERIES IMPROVEMENT PROGRAM
GRANT APPLICATION
(please fill in the highlighted areas)

I. APPLICANT INFORMATION

A. Applicant Name: David Moser, Montana fish, Wildlife & Parks

B. Mailing Address: 1400 South 19th Street

C. City: Bozeman State: MT Zip: 59718-5496

Telephone: (406)-994-6938 E-mail: davemoser@mt.gov

D. Contact Person: Same

Address if different from Applicant:

City: State: Zip:

Telephone: E-mail:

E. Landowner and/or Lessee Name (if other than Applicant): James and Beatrice Taylor

Mailing Address: 1045 Reeves Road, Ste E

City: Bozeman State: MT Zip: 59718

Telephone: (406) 587-5594 E-mail: jim@wytana.com

II. PROJECT INFORMATION*

A. Project Name: Bostwick Creek Fish Barrier

River, stream, or lake: Bostwick Creek

Location: Township: T1S Range: R6E Section: 6
Latitude: 45.7806°N, Longitude: -111.0239°W *within project (decimal degrees)*

County: Gallatin

B. Purpose of Project:

Westslope Cutthroat Trout - *Oncorhynchus clarkii lewisi* (WCT) - were first described by the Lewis and Clark Expedition in 1805 near Great Falls, Montana, and are recognized as one of 14 interior subspecies of cutthroat trout. The historical range of WCT includes Idaho, Montana, Washington, Wyoming, and Alberta, Canada. In Montana, WCT occupy the Upper Missouri and Saskatchewan River drainages east of the Continental Divide, and the Upper Columbia Basin west of the Divide. Although still widespread, WCT distribution and abundance in Montana has declined significantly in the past 100 years due to a variety of causes including introductions of nonnative fish, habitat degradation, and over-exploitation (Hanzel 1959, Liknes 1984, McIntyre and Rieman 1995, Shepard et al. 1997, Shepard et al. 2003). The declining status of WCT has lead to its designation as a Species of Special Concern by the State of Montana, a Sensitive Species by the U.S. Forest Service (USFS), and a Special Status Species by the Bureau of Land Management (BLM). In addition, in 1997 a petition was submitted to the U.S. Fish and Wildlife Service (USFWS) to list WCT as "threatened" under the Endangered Species Act (ESA). USFWS status reviews have found that WCT are "not warranted" for ESA listing (DOI 2003); however, this finding was in litigation until 2008. Additional efforts to list WCT under ESA are inevitable.

In an effort to advance range-wide WCT conservation efforts in Montana a Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana was developed in 1999 by several federal and state resource agencies (including the BLM, Montana Fish, Wildlife & Parks [FWP], the USFS, and Yellowstone National Park [YNP]), non-governmental conservation and industry organizations, tribes, resource users, and private landowners (FWP 1999: MOU). The MOU outlined goals and objectives for WCT conservation in the Montana, which if met, would significantly reduce the need for special status designations and listing of WCT under the ESA. The MOU was revised and endorsed by signatories in 2007 (FWP 2007). As outlined in these MOU's, the primary management goal for WCT in Montana is to ensure the long-term self-sustaining persistence of the subspecies in its historical range. This goal can be achieved by maintaining, protecting, and enhancing all designated WCT "conservation" populations, and by reintroducing WCT to habitats where they have been extirpated.

The Gallatin River drainage historically supported WCT in over 1,000 miles of stream. Currently, the basin maintains two small, partially protected populations of pure WCT (Elkhorn Creek [restored from Wildhorse and Wilson] and Wild Horse Creek) in less than 1% of historical habitat. The remaining miles of stream that once supported WCT in the Gallatin Drainage have either been displaced by Brook Trout (*Salvelinus fontinalis*) or have hybridized with Rainbow Trout (*Oncorhynchus mykiss*). The only method to protect WCT populations from hybridization with rainbow trout and competition with brook trout is the use of fish barriers. This project aims to modify an existing weir structure (Figure 1) to be a fish barrier (see addendum) and protect a severely threatened non-hybridized native population in Bostwick Creek. Bostwick Creek WCT are currently threatened by recent non-native trout invasions. Rainbow Trout and Brook Trout have rapidly moved upstream from lowland reaches. Project proponents have short window of opportunity to block upstream movement of fishes and remove recently hybridized trout and brook trout using electrofishing techniques. This proposed fish barrier and removal project has several advantages, 1) the cost of this structure is much reduced because of existing infrastructure (i.e. current weir), 2) the structure is located on private property, thus illegal introductions after restoration will be minimized, and 3) a small, but threatened, remnant population of WCT already exists in the drainage. Without projects such as these non-hybridized WCT face extinction in the Gallatin and Madison drainages over the short to medium term (25 to 50 years). Projects such as these are the only measure that can ensure persistence of WCT in the presence of non-native trouts. The objective of this project is to protect one of the three last remaining populations of WCT in the Gallatin Drainage. This work, if completed will increase the stream miles that support protected WCT by double. This effort will go a long way toward preventing extinction of WCT in the Gallatin River. Letters of support of this project developed during application for OneFly Grant monies are attached.

References available upon request.

C. Brief Project Description:

Bostwick Creek currently supports populations of brook trout, hybrid trout (WCT X RBT), and pure Westslope Cutthroat Trout. Remaining WCT are currently being displaced by Brook Trout and are hybridizing with Rainbow Trout. Two years ago pure WCT from Bostwick Creek were transferred to Placer Creek, a tributary to North Fork Spanish Creek (Gallatin). Bostwick Creek likely still holds a number of pure WCT.

After construction of the fish barrier we plan concentrated efforts – two removals per year for 2 to 3 years - to identify and re-locate pure fish whilst removing non-native brook trout and hybrids using intensive electrofishing. After removal of all fish in an approximately 3 mile stretch of stream, native WCT rescued from the population would be returned to their natal habitat.

Fish barriers have been used with great success in Montana to protect existing miles of stream holding WCT. Fish barriers have also been used to expand populations into historically occupied habitat. Fish barriers require locations that have incised channels, bedrock if possible, and some protection from illegal transfers of non-native fish by intentional or unintentional saboteurs. A design and cost opinion has been completed by United States Forest Service engineers – See addendum. Ideally, construction would proceed in the late summer of 2016. After construction of the fish barrier, removals of non-native brook trout and hybridized WCT will be completed by MFWP and USFS personnel. Non-hybridized WCT will be identified using genetic testing of individual fish (SNPS methodology). Pure fish would be temporarily be held off site in a protected stream in the Gallatin Drainage. Placer Creek is the best candidate for temporary transfer and has been stocked previously with a sub-set of the Bostwick Creek WCT population.

After modification of the existing weir into a fish barrier, removals of non-native fish will commence. Removals should take no more than 2 years. The goal is to maintain the WCT in Bostwick Creek at 100% purity. Additional WCT restoration efforts will continue in the Gallatin Drainage (North Fork Spanish Creek). Bostwick Creek, Wild Horse Creek and Elkhorn Creek would provide the nearest neighbor seed stock to restore these other streams to populations of 100% genetic purity. By using local stocks that may have important adaptations and rare alleles the genetic legacy of WCT in the Gallatin Drainage will be preserved.

D. Length of stream or size of lake that will be treated: 3 Miles

E. Project Budget:

Grant Request (Dollars): $ $58,520

Contribution by Applicant (Dollars): $ _____ In-kind $ _____

(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): $ $31,083 In-kind $ $3,728

(attach verification - See page 2 budget template)

Total Project Cost: $ $93,332

F. Attach itemized (line item) budget – see template

G. Attach specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support and fish biologist support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete supplemental questionnaire (fwp.mt.gov/habitat/futurefisheries/supplement2.doc).

H. Attach land management and maintenance plans that will ensure protection of the reclaimed area.

III. PROJECT BENEFITS*

A. What species of fish will benefit from this project?:

Westslope Cutthroat Trout *(Oncorhynchus clarkii lewisi)*

B. How will the project protect or enhance wild fish habitat?:

Provide a barrier to upstream movement of competing and hybridizing species of trout. There will be no direct enhancement of wild fish habitat – just prevention of imminent extinction of locally adapted WCT.

C. Will the project improve fish populations and/or fishing? To what extent?:

This project will provide a unique fishing opportunity for native WCT. Public access via USFS trail system is limited and from the north of private property. The primary goal of this project is to preserve native WCT; there will be an opportunity for anglers willing to hike to access these rare and important fish. There are certainly citizens who value these fish. Westslope cutthroat trout have survived for 8 to 10 million years. It would be a great ecological blow to lose them in a mere 100 years in drainages where they once thrived.

D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

The project will increase opportunity to fish for Montana's state fish.

E. The project agreement includes a 20-year maintenance commitment. If you are unable to meet this commitment, please explain why:

Montana Fish, Wildlife and Parks are committed to this project over the long term. The landowner is also committed to restoration and protection of the species in Bostwick Creek over the long term. We are currently working on a long term MOU for this project with the landowner. He has already been more than willing to allow Montana Fish, Wildlife & Parks personnel and USFS personnel to complete restoration work on his property.

F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

Invasion of non-native salmonids into the Bostwick Creek WCT population. The project will protect native WCT from upstream migration through construction of a fish barrier. Removals of non-native species as well as preservation of remaining non-hybridized WCT will be through electrofishing removals.

G. What public benefits will be realized from this project?:

Preservation of a State species of special concern, prevention of listing of WCT as a threatened or endangered species, and preservation of the only trout species native to the Gallatin River drainage

H. Will the project interfere with water or property rights of adjacent landowners? (explain):

No, Downstream water users have been informed of the project and no changes to points of diversion of water quantity will be changed

I. Will the project result in the development of commercial recreational use on the site?: (explain):

No

J. Is this project associated with the reclamation of past mining activity?:

No

Each approved project sponsor must enter into a written agreement with the Department specifying terms and duration of the project.

IV. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature: DAVID MOSER MFWP Date: 5/31/2016

Sponsor (if applicable):

***Highlighted boxes will automatically expand.**

Mail To: **Montana Fish, Wildlife & Parks**
Habitat Protection Bureau
PO Box 200701
Helena, MT 59620-0701

E-mail To: **Michelle McGree**
mmcgree@mt.gov
(electronic submissions MUST be signed)

Incomplete or late applications will be returned to applicant.
Applications may be rejected if this form is modified.

*****Applications may be submitted at anytime, but must be received by the Future Fisheries Program office in Helena before December 1 and June 1 of each year to be considered for the subsequent funding period.*****

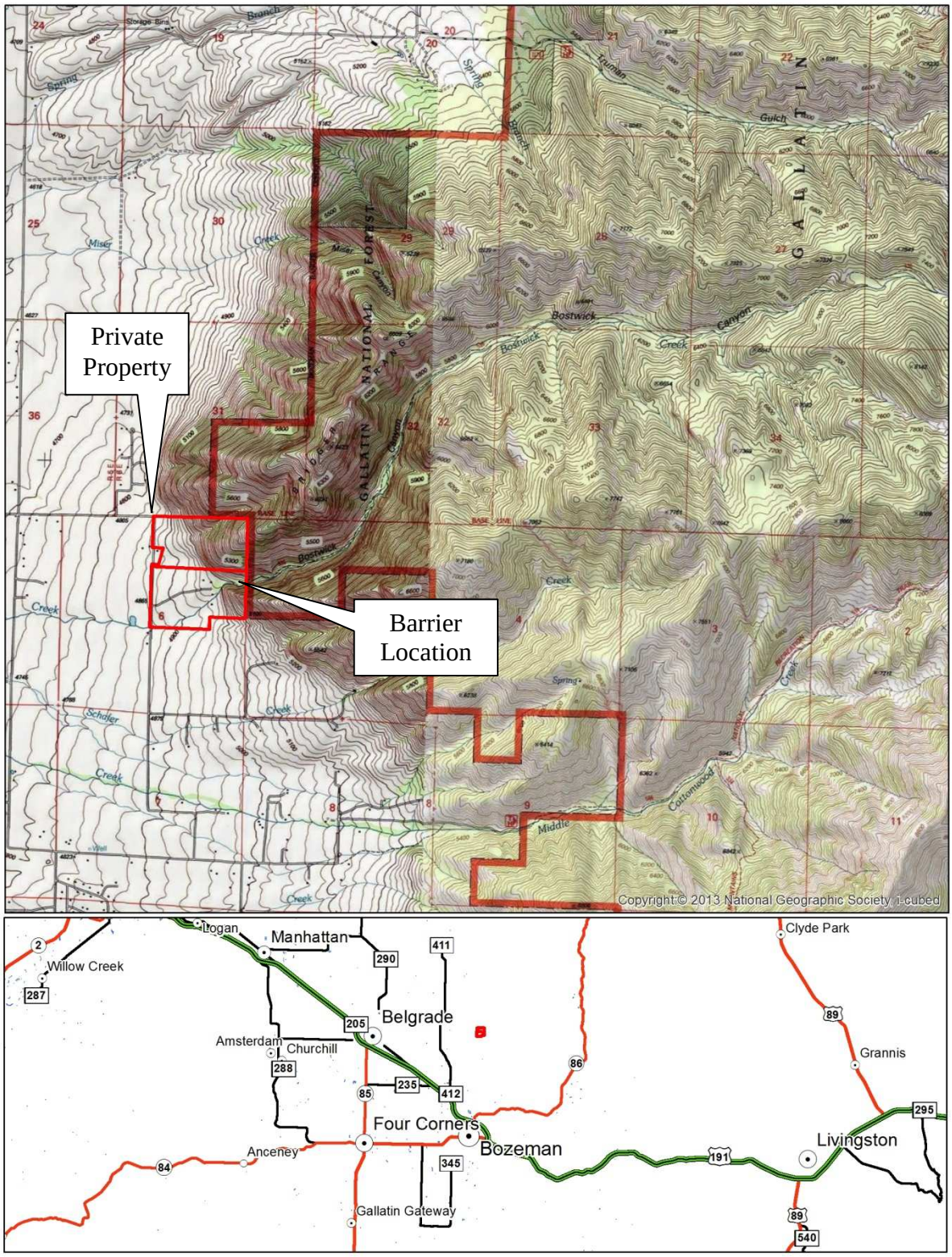

Figure 1. Site location and general vicinity, Bostwick Creek Fish Barrier

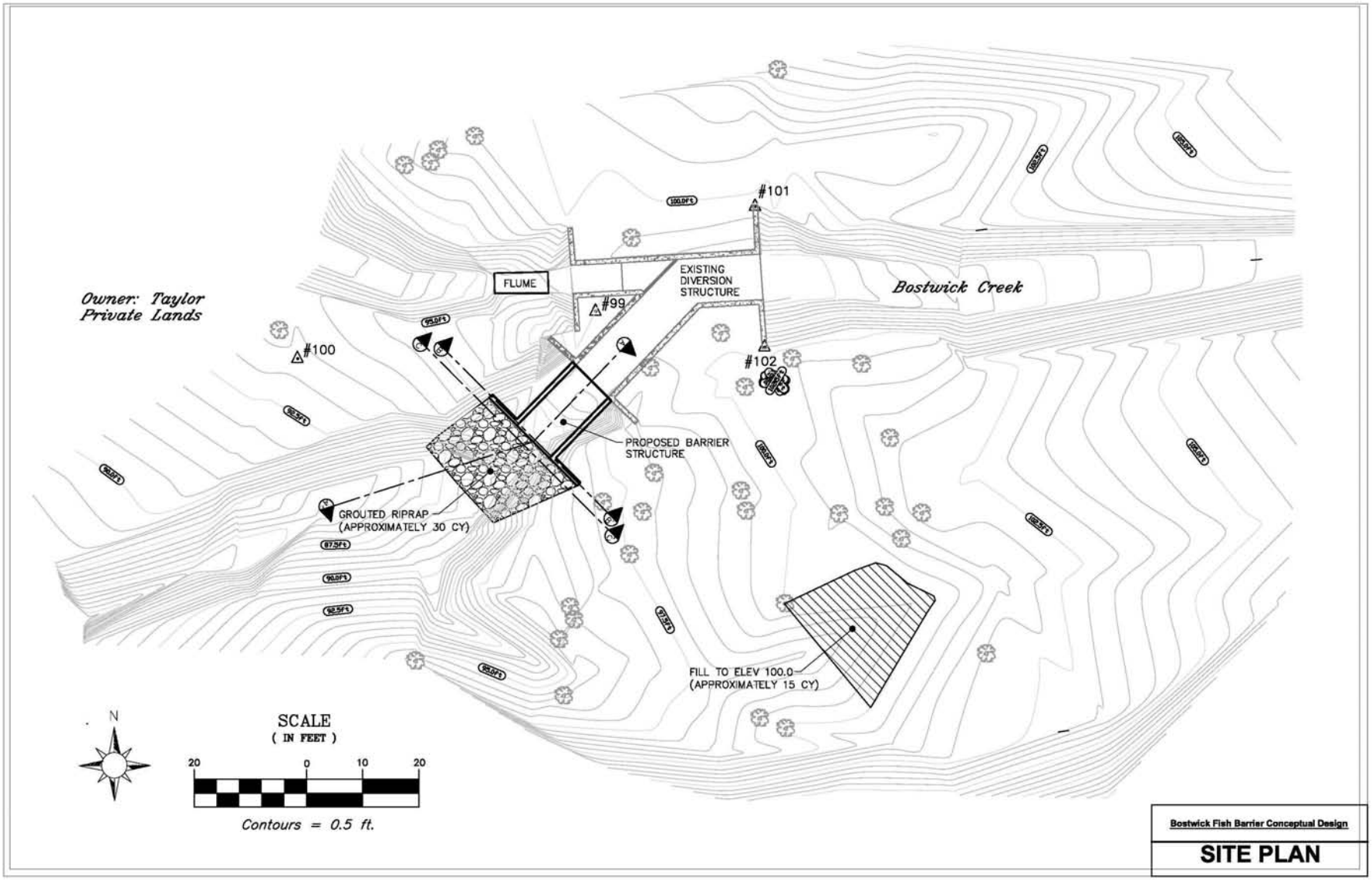

Figure 2. Site plan with existing diversion structure and proposed new construction

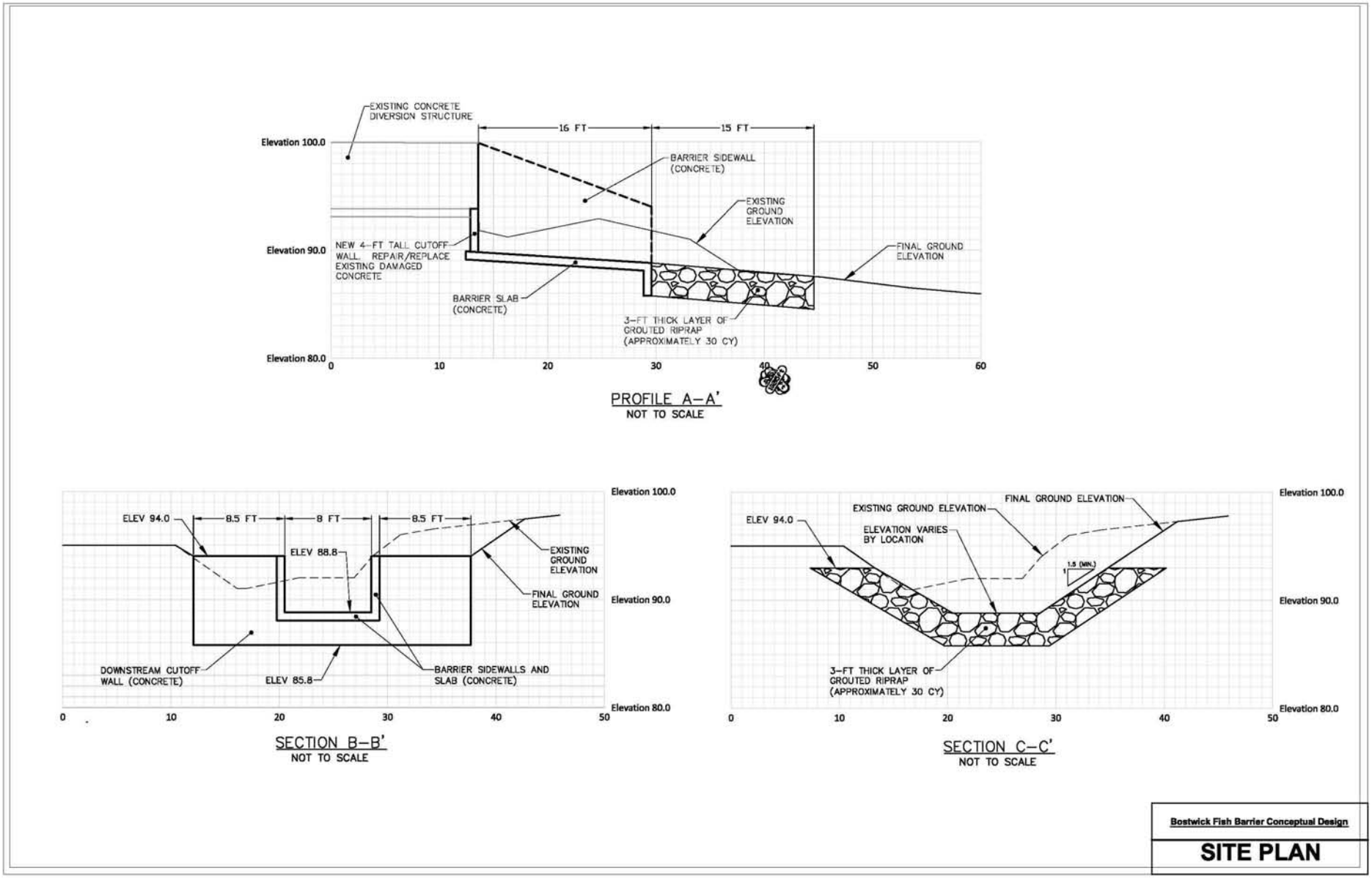

Figure 3. Section views of proposed barrier structure

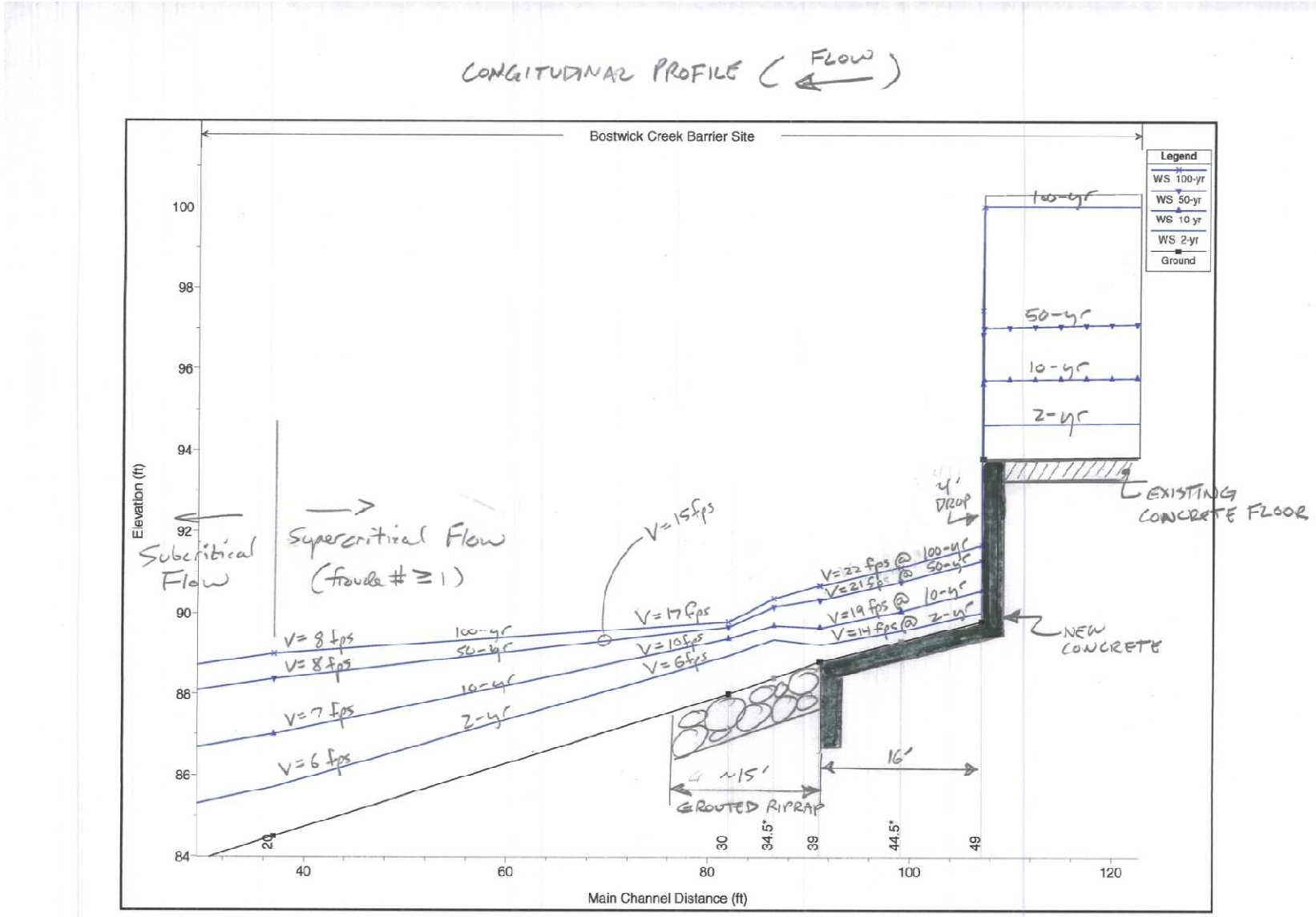

Figure 4. HEC-RAS analysis up to 100 year flow recurrence – USGS regression derived.

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Northern Rocky Mountain Science Center
PO Box 173492
Bozeman, MT 59717-3492

February 20, 2016

Jackson Hole One Fly:

I am writing a letter of support for the Fish Barrier and Westslope Cutthroat Trout Restoration proposal submitted by David Moser (Fisheries Biologist, Montana Fish, Wildlife and Parks). Despite large tracts of public land in Montana, species of cutthroat trout have been severely compromised as a result of historic non-native rainbow trout, brook trout, and brown trout introductions. Research over the past 2 decades has illustrated the negative effects of these non-native salmonids on cutthroat trout species through competition, predation, and hybridization. Today, very few populations of westslope cutthroat trout remain in the Greater Yellowstone Area, and within the Gallatin River, fewer than 5 small populations are thought to persist.

Creating refugia from non-native species has been demonstrated as an important, robust conservation approach for cutthroat trout. Refugia from non-natives are expected to be increasingly important in the context of climate change as non-native salmonids (e.g., brown trout, rainbow trout) have increased thermal tolerances and the impacts of these species are likely to be exacerbated. The proposed work by David Moser that would create a barrier and remove existing threats from non-native salmonids represents an important, on-the-ground project that will ultimately enhance the persistence of westslope cutthroat trout in the foreseeable future. Securing populations through collaborations with private landowners also fosters improving relationships between agencies and the private sector. Given that private land comprises a large portion of lower-elevation streams, capitalizing on such opportunities heightens the likelihood of long term persistence by increasing the amount of habitat available to native trout. It is exciting to see projects such as the one proposed by David Moser that are likely to enhance populations of westslope cutthroat trout in the Gallatin River.

Please contact me with any further questions and/or concerns for this project.

Sincerely,

Robert Al-Chokhachy

Robert Al-Chokhachy, PhD
Research Fisheries Biologist
US Geological Survey
Northern Rocky Mountain Science Center
Bozeman, MT
Email: ral-chokhachy@usgs.gov

Revised July 16, 2015

United States Department of Agriculture | Forest Service | Rocky Mountain Research Station | 800 East Beckwith Avenue
Missoula, MT 59801
406.542.3254 (p)
406.543.2663 (f)
mkyoung@fs.fed.us

File Code: 4000

Date: 23 February 2016

To the "Jackson Hole One Fly" Proposal Review Committee:

Dave Moser (Montana Fish, Wildlife and Parks) and Bruce Roberts (Custer Gallatin National Forest) asked that I provide one of the two technical reviews for their 2016 proposal entitled "Bostwick Creek Westslope Cutthroat Trout Restoration Project." In my capacity as a Research Fisheries Biologist for the Rocky Mountain Research Station, I was the first to survey Bostwick Creek on 21 September 2009 as part of systematic inventory of fish and amphibians on federal lands throughout western Montana and northern Idaho. Our laboratory found that this population consisted of both genetically pure westslope cutthroat trout as well as first-generation (F1) westslope x rainbow trout hybrids indicating a recent invasion of rainbow trout.

With the threat of hybridization looming, area fisheries biologists genetically tested and translocated a portion of the remaining genetically pure westslope cutthroat trout to nearby Placer Creek with the hopes of someday returning their progeny back to Bostwick Creek. To accomplish this task, a barrier (modification of an existing irrigation diversion) will have to be constructed on private land near the mouth of the canyon along with crews mechanically removing the remaining non-natives within the upper 3.25 miles of stream habitat.

Bostwick Creek is a very productive stream rearing some of the largest westslope cutthroat trout on the Custer-Gallatin National Forest. Stream flow, length of habitat, quality of habitat, and productivity are all adequate to insure that this refounded population will be viable and persist well into the future. Access difficulty also adds an additional benefit to the overall project reducing the likelihood of intentional or inadvertent stocking of non-native trout.

As an independent technical reviewer, I fully support this proposal. This project is a good example of sound on-the-ground conservation actions that help this subspecies, especially in the Upper Missouri River basin. This proposal is also consistent with the multi-party signed Conservation Agreement designed to protect and enhance both subspecies of cutthroat trout in Montana.

If you have any further questions, I can be reached at (406) 542-3254 or mkyoung@fs.fed.us. Thank you for your time and consideration of this Bostwick Creek proposal.

Sincerely,

Michael K. Young
Research Fisheries Scientist

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

Both tables must be completed or the application will be returned

WORK ITEMS (ITEMIZE BY CATEGORY)	NUMBER OF UNITS	UNIT DESCRIPTION*	COST/UNIT	TOTAL COST	CONTRIBUTIONS			
					FUTURE FISHERIES REQUEST	IN-KIND SERVICES**	IN-KIND CASH	TOTAL
Personnel								
Survey	1		$1,863.78	$ 1,863.78		1,863.78		$ 1,863.78
Design	1		$1,863.78	$ 1,863.78		1,863.78		$ 1,863.78
Engineering				$ 5,000.00			5,000.00	$ 5,000.00
Permitting				$ -				$ -
Oversight				$ 14,000.00			14,000.00	$ 14,000.00
Labor				$ -				$ -
			Sub-Total	$ 22,727.55	$ -	$ 3,727.55	$ 19,000.00	$ 22,727.55
Travel								
Mileage				$ -				$ -
Per diem				$ -				$ -
			Sub-Total	$ -	$ -	$ -	$ -	$ -
Construction Materials* **								
Excavation	140	CY	$33.00	$ 4,620.00	4,620.00			$ 4,620.00
Compacted Backfill	140	CY	$66.00	$ 9,240.00	9,240.00			$ 9,240.00
Grouted Rip-Rap	40	CY	$110.00	$ 4,400.00	4,400.00			$ 4,400.00
Compacted Bedding	10	CY	$66.00	$ 660.00	660.00			$ 660.00
Steel Reinforced Concrete	25	CY	$1,100.00	$ 27,500.00	27,500.00			$ 27,500.00
Erosion Control	1	LS		$ 1,100.00	1,100.00			$ 1,100.00
Water Management	1	LS		$ 4,400.00	4,400.00			$ 4,400.00
Clearing and Grubbing	1	LS		$ 1,100.00	1,100.00			$ 1,100.00
Repair Damaged Concrete, Existing Structure	1	LS		$ 3,300.00	3,300.00			$ 3,300.00
Access, Rehab, Stockpiling	1	LS		$ 2,200.00	2,200.00			$ 2,200.00
			Sub-Total	$ 58,520.00	$ 58,520.00	$ -	$ -	$ 58,520.00
Equipment								
				$ -				$ -

(Revised 6/1/2016)

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
			Sub-Total	$ -	$ -	$ -	$ -	$ -
Mobilization								
				$ 12,084.00			12,084.00	$ 12,084.00
				$ -				$ -
				$ -				$ -
				$ -				$ -
			Sub-Total	$ 12,084.00	$ -	$ -	$ 12,084.00	$ 12,084.00
			TOTALS	$ 93,331.55	$ 58,520.00	$ 3,727.55	$ 31,084.00	$ 93,332

*Units = feet, hours, inches, lump sum, etc.

**Can include in-kind materials. Justification for in-kind labor (e.g. hourly rates used for calculations). Describe here or in text.

***The Future Fisheries Review Panel recommends a maximum fencing cost of $1.50 per foot

MATCHING CONTRIBUTIONS (do not include requested funds)

CONTRIBUTOR	IN-KIND SERVICE	IN-KIND CASH	TOTAL	Verified? (Y/N)
Western Native Trout Initiative	$ -	$ 5,000.00	$ 5,000.00	N
Bring Back the Natives	$ -	$ 26,083.00	$ 26,083.45	N
USFS - Design and Engineering	$ 3,727.55	$ -	$ 3,727.55	Y
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
TOTALS	$ 3,727.55	$ 31,083.00	$ 34,811.00	